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STATE OF ALASKA
Walter J. Hickel, Governor

ANNUAL REPORT OF PROGRESS, 1967 - 1968

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-9

SPORT FISH INVESTIGATIONS OF ALASKA

ALASKA DEPARTMENT OF FISH AND GAME
Augie Reetz, Commissioner

Alex H. McRea, Director
Division of Sport Fish

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INTRODUCTION

This report of progress consists of findings and work accomplished under the State of Alaska Federal Aid in Fish Restoration Project F-5-R-9, "Sport Fish Investigations of Alaska."

The project during this reporting period was composed of 21 separate studies. Of these, seven jobs continued the inventorying and cataloging of the numerous waters, providing a comprehensive index of the State's recreational waters. Nine jobs accomplished special studies involving Dolly Varden, grayling, silver salmon, king salmon and sheefish, among others. The remaining five jobs are designed to accomplish creel census, migration, access and silver salmon egg-take studies. The egg-take study, Job 7-F, was inactive because egg-takes were accomplished under other projects.

Special reports on specific phases of the Dolly Varden Life History Study have been published in the Department's Research Report series.

The information gathered from all of these studies provides the background necessary for better management and assists in development of future investigational studies.

The subject matter contained within these reports is often fragmentary in nature. The findings may not be conclusive and the interpretations contained therein are subject to re-evaluation as the work progresses.

RESEARCH PROJECT SEGMENT

STATE:	ALASKA	Name:	Sport Fish Investigations of Alaska.
Project No.:	F-5-R-9		
Job No.:	12-D	Title:	Creel Census of the Sport Fishes of the Bristol Bay Drainage.

Period Covered: May 18, 1967 through December 31, 1967.

ABSTRACT

Voluntary creel census reports from the military sport fishing facilities on the Naknek River are summarized. Use figures from military sources are cited. Characteristics of the fisheries at the several camps are discussed to provide background for interpretation of both reported and estimated figures.

Results of a direct census of catch and effort during the fishery for king salmon, Oncorhynchus tshawytscha, permit estimates of civilian participation by two methods, both of which agree closely. These estimates, combined with estimates of king salmon catch at the three military sites, allow calculation of a total estimated catch of this species for the Naknek River of 1,579 fish. Reasons are cited to support the conclusion that the total number of king salmon taken by anglers during 1967 was not larger than the sport catch of this species in previous years.

The percentages of various fish species entering the military catch in the Naknek River are reported and compared, with special reference to rainbow trout, Salmo gairdneri, which may have increased in availability over the preceding year. The problems involved in accomplishing the objectives of the job description with regard to this species are discussed. The conclusion is reached that methods of sampling the fishery which have been used to date are incapable of yielding a dependable picture of the rainbow trout fishery as it now exists.

The fishery on red salmon, O. nerka, and silver salmon O. kisutch, apparently showed little use change from the previous year. Pink salmon, O. gorbuscha, were not present in significant numbers during 1967 in the Naknek River.

In conjunction with other sport fish investigations, the recreational fishery on Nuyakuk Lake and Tikchik Lake and selected tributaries was monitored for the first time by Division personnel. Discussion is presented on the species and size composition of the sport catch and the total estimated and recorded effort expended at the Tikchik Lake Narrows.

RECOMMENDATIONS

1. That the collection of creel census data from the military recreation camps be continued and that efforts be directed toward finding a dependable means of determining the ratio between reported effort and catch and actual effort and catch at each camp.

2. That the observations carried out during the 1967 king salmon fishery be extended and governed by a statistical design, within limits of time and manpower, to estimate the number, size, and catch per hour of rainbow trout, king salmon, and silver salmon.

3. That the voluntary creel census conducted with guides and lodge owners during this study period be extended during the 1968 season and directed toward obtaining seasonal totals of fishing effort expressed in angler days.

OBJECTIVES

To determine the extent and impact of angling pressures on the sport fish resources in specific recreational areas.

To determine and provide recommendations for future investigations and management of the study area waters.

TECHNIQUES USED

Close contact was maintained with the operators of the military recreation camps on the Naknek River. Periodic checks of anglers and catches were made at each facility during a portion of its operational period. At the Base Dock, actual counts were made of anglers and fish. At the Lake and Rapids Camps, periodic counts were made of the actual numbers of fish in frozen storage for comparison with corresponding census reports. Figures for total seasonal use of each of the three facilities were supplied following request to the respective responsible authorities.

A direct creel census, including ratio of military to civilian anglers, was conducted by Sport Fish Division personnel on the Naknek River during the period of the king salmon fishery and at the Tikchik Narrows from mid-August to mid-October.

Personal letters requesting total angler-days of effort for the season were sent to a number of guides and lodge operators known to have been active in the study area during the season.

FINDINGS

Naknek River

Reported catches from the Lake and Rapids military recreation camps during 1967 are summarized separately in Tables 1 and 2.

The Alaskan Command (ALCOM), which handles traffic through the two recreation camps, reported a total of 1,317 guests at Lake Camp and 972 at the Rapids Camp. Average stay per angler for each of the two camps is reported to be three days for a total of 6,867 angler-days during 1967. This figure is far in excess of effort, as indicated by military census reports received or observations by Department personnel. No apparent explanation of this marked difference is readily available, though most factors involved do tend to minimize totals obtained through the last named means. The camps operated beyond the period for which reports were received and visiting military anglers also fished in the area during much of the year when the camps were not in operation. However, even consideration of these factors does not satisfactorily explain the discrepancy.

TABLE 1 - Angling Pressure and Composition of Catch at Lake Camp, Naknek River, 1967.

Fishing Periods	5/16-5/31	6/1-6/15	6/16-6/30	7/1-7/15	7/16-7/31	8/1-8/15	8/16-8/31	TOTAL
Anglers Reporting	59	62	90	76	102	* -	* -	389
Total Hours	445	316	484	323	438	-	-	2006
Catch Composition:								
Rainbow Trout	141	228	169	30	126	-	-	694
Red Salmon	-	-	6	445	520	-	-	971
King Salmon	-	-	50	4	-	-	-	54
Silver Salmon	-	-	-	-	-	-	-	-
Pink Salmon	-	-	-	-	1	-	-	1
Chum Salmon	-	-	-	-	-	-	-	-
Northern Pike	2	3	7	-	-	-	-	12
Lake Trout	9	10	10	-	-	-	-	29
Dolly Varden	8	3	2	-	1	-	-	14
Grayling	1	1	1	1	-	-	-	4
Round Whitefish	1	-	-	-	-	-	-	1
TOTAL	162	245	245	480	648	-	-	1780
Catch Per Hour	.36	.78	.51	1.49	1.48	-	-	.89

*No reports received after 7/31; camp closed about October 1.

TABLE 2 - Angling Pressure and Composition of Catch at Rapids Camp, Naknek River, 1967.

Fishing Periods	6/1-6/15	6/16-6/30	7/1-7/15	7/16-7/31	8/1-8/15	8/16-8/31	TOTAL
Anglers Reporting	68	181	152	55	* -	* -	456
Total Hours	513	1254	1052	219	-	-	3038
Catch Composition:							
Rainbow Trout	121	113	51	34	-	-	319
Red Salmon	-	140	394	217	-	-	751
King Salmon	7	243	214	-	-	-	464
Pink Salmon	-	-	-	1	-	-	1
Lake Trout	-	1	-	3	-	-	4
Dolly Varden	-	5	8	17	-	-	30
Grayling	64	4	5	5	-	-	78
Round Whitefish	2	-	-	-	-	-	2
TOTAL	194	506	672	277	-	-	1649
Catch Per Hour	.38	.40	.64	1.26	-	-	.54

*No reports received after 7/31; camp closed 8/18.

Table 3 summarizes reported information from the U.S. Air Force Base Dock. Voluntary reporting at this facility jumped from a 1966 figure of 15.2 percent (Redick, 1967) to 45 percent in 1967, calculating total effort from Base Dock records of boat rentals (Table 4). For the purpose of calculating the estimated military king salmon sport catch later in this report, the observed figure of 72 percent for the month of June is used. This figure was obtained by direct checking during the majority of the king salmon season and is used in preference to a calculated figure obtainable from Table 4. The improvement in voluntary reporting is attributed to increased contact between Sport Fish Division employees and military personnel during this important period. Following the king season, reporting again lapsed.

From early June, when king salmon are first available, through July 12, many guests from both the Lake and Rapids Camps fish from the Base Dock at King Salmon. Boats are moved from these two camps to this site on the lower river, since the most productive area for the king fishery lies in that portion of the stream between the end of the north-south airport runway and the mouth of Smelt Creek (Figure 1). Voluntary census reports are adversely affected by this arrangement since many of these "visiting" anglers fail to fill in the form at the Base Dock when they clean their fish there and subsequently neglect to do so after returning to their own camp. In an effort to measure the effectiveness of the voluntary census during this period, the numbers of frozen fish present in the cold storage lockers of the two recreation camps were counted immediately prior to the departure of individual parties of guests. These counts were compared with numbers of fish reported by these same parties, as recorded on the ALCOM forms. Difficulty in accurately timing the freezer checks reduced the complete count originally intended down to the status of a strong sample. The base which this sample provides, however, is considered broad enough to allow its use in calculating the estimates which follow later in this report.

With the exceptions of (1) the interchange noted in the previous paragraph and (2) some effort in the Lake Camp area by Rapids Camp anglers who travel there via vehicle to fish for red salmon after this species is no longer available downriver, the angling activities of the two upper camps are largely independent. Base Dock and Rapids Camp anglers interchange freely throughout the entire lower river area. Figure 2 shows the fishing areas normally available to anglers from each camp, together with the boundaries of the April 15 - June 7 rainbow trout closure.

The 1967 data, similar to 1966, include reports of effort in the Lake Camp area commencing approximately 10 days earlier than in prior years for which figures are shown. Directed almost entirely toward rainbow trout, this new effort was made possible by the 1965 regulation which moved the upper limit of the spring rainbow trout closure from the Katmai National Monument Boundary to a point approximately one mile below the Lake Camp. An area of excellent fishing was thus opened throughout the year. Regulations adopted by the Board of Fish and Game for 1968 returned the upper boundary, upriver, to a point approximately one mile east of the Lake Camp.

The 1967 figures do not reflect catches of rainbow trout taken and released in the closed area by anglers ostensibly fishing for other species.

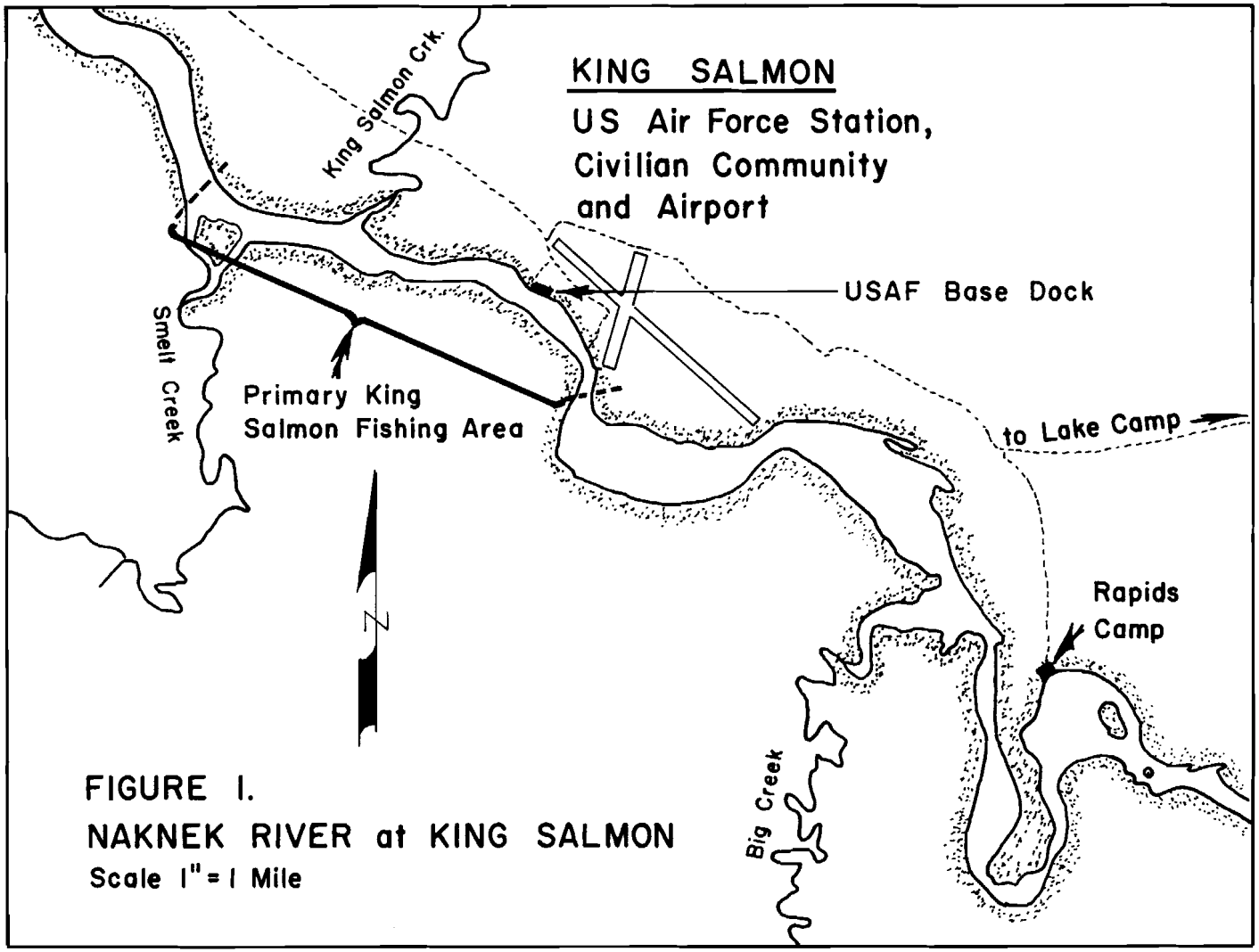

FIGURE 1.
NAKNEK RIVER at KING SALMON
Scale 1" = 1 Mile

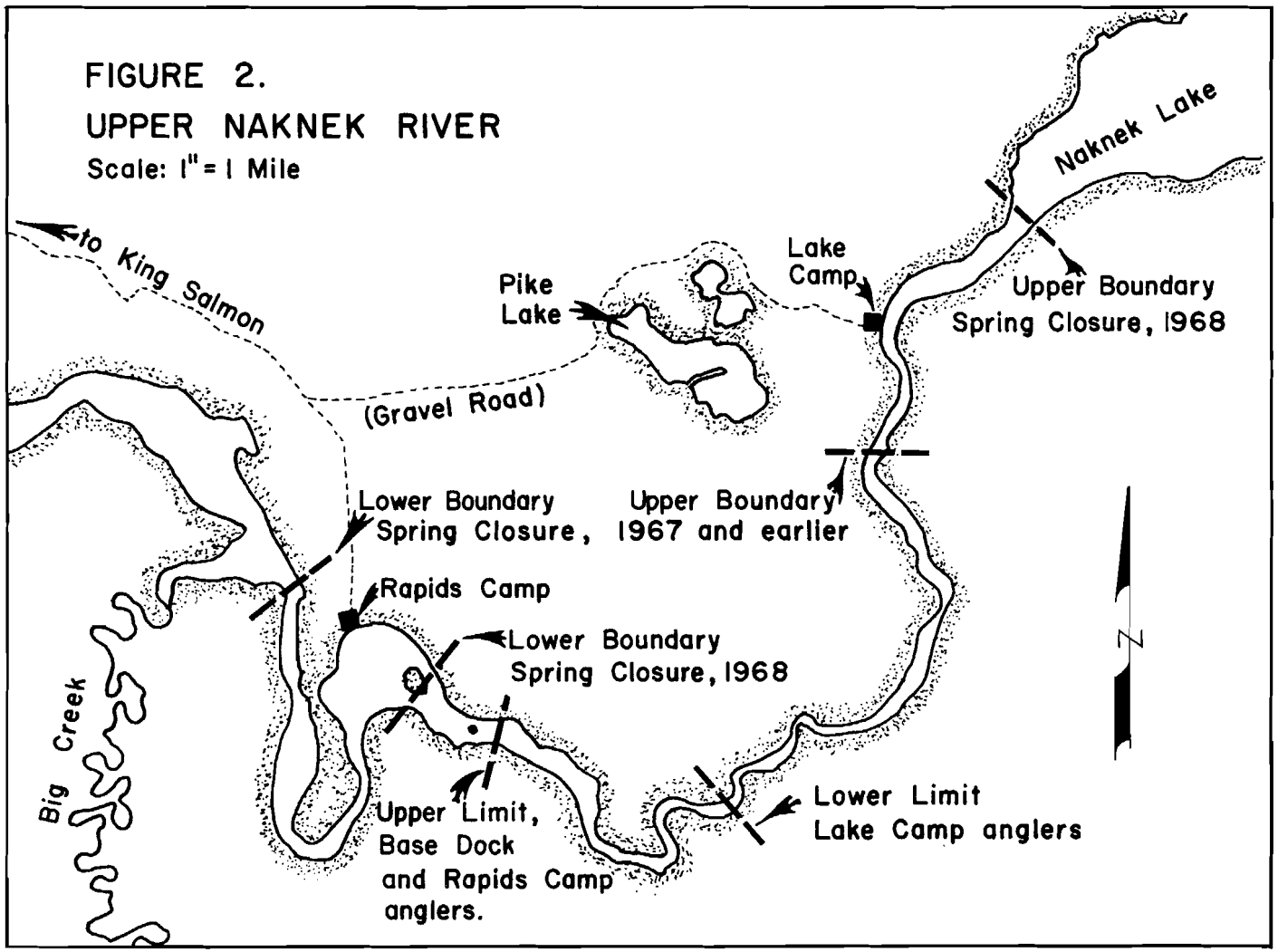
FIGURE 2.
UPPER NAKNEK RIVER
Scale: 1" = 1 Mile
to King Salmon
(Gravel Road)
Pike Lake
Lake Camp
Naknek Lake
Upper Boundary Spring Closure, 1968
Lower Boundary Spring Closure, 1967 and earlier
Upper Boundary
Rapids Camp
Lower Boundary Spring Closure, 1968
Big Creek
Upper Limit, Base Dock and Rapids Camp anglers.
Lower Limit Lake Camp anglers
N

TABLE 3 - Angling Pressure and Composition of Catch at U.S.A.F. Base Dock, Naknek River, 1967.

Fishing Periods	6/1-6/15	6/16-6/30	7/1-7/15	7/16-7/31	8/1-8/15	8/16-8/31	9/1-9/15	9/16-9/30	Total
Anglers Reporting	171	226	98	8	19	52	2	2	578
Total Hours	545	756	308	21	55	161	8	8	1862
Catch Composition:									
Rainbow Trout	26	10	11	6	2	48	6	-	109
Red Salmon	-	9	28	40	-	-	-	-	77
King Salmon	39	234	106	-	-	-	-	-	379
Silver Salmon	-	-	-	-	38	79	-	-	117
Pink Salmon	-	-	-	1	-	-	-	-	1
Chum Salmon	-	-	-	-	1	-	-	-	1
Lake Trout	-	-	1	-	-	2	-	-	3
Dolly Varden	1	4	1	-	-	5	-	6	17
Grayling	-	1	1	-	1	1	-	-	4
TOTAL	66	258	148	47	42	135	6	6	708
Catch Per Hour	.12	.34	.48	2.24	.76	.84	.75	.75	.38

TABLE 4 - Hours of Military Boat Rental and Estimated Angler Hours From U.S.A.F. Dock at King Salmon, 1967.

Month	Fishing Parties*	Hours Rental*	Estimated Total Anglers**	Estimated Total Angling Hours**
June	284	854	653	1,964
July	128	422	294	971
August	89	319	205	734
September	61	260	140	598
Total	562	1,855	1,292	4,267

*From U.S.A.F. Personnel Services receipts for boat rental.
**Hours of rental and fishing parties estimated by multiplying by 2.3 - the average number of anglers per boat.

Creel Census Studies:

One of the major objectives of the present study is an adequate assessment of the amount of effort contributed in the overall fishery by civilian participation. In an effort to obtain an estimate of the military-civilian ratio during the king salmon fishery, twenty-one non-random angler surveys were conducted between June 14 and July 10 in the primary king salmon fishing area. The results obtained show 71.6 percent of the anglers to be military and 28.4 percent civilian. This agrees closely with the 72.6:27.4 ratio reported for the 1964 season (Paddock, 1965).

The total number of anglers checked during this period was 592, representing 1,960 angler hours. Comparison of effort present on week-days with that observed on weekends showed no significant difference in either the total volume of participation or in the military-civilian make-up of the fishery. This is probably the result of maximum use of available boats during much of the period sampled. The 1967 survey tended to measure peak periods more thoroughly than periods of lesser effort. A stratified random sampling procedure could result in some reduction of the present estimate of civilian effort, since civilian pressure showed a significant increase in the evening. Military anglers are generally present quite uniformly throughout the day.

King Salmon - Table 5 lists the estimated total military sport catch of king salmon on the Naknek River for 1967. Combined estimated catches for the three military installations total 1,214 fish. Application of the military-civilian participation ratio obtained from the direct census yields an estimated civilian catch of 481 kings, using the formula:

$$\frac{X}{M} \times 100 = E$$

where:

X = the sum of X_1, X_2, X_3.
M = the percent of total fishing effort attributable to military anglers, from direct census data.
E = the total estimated sport catch of king salmon in the Naknek River during the 1967 season.

Combining the military and civilian estimates produces a total harvest figure from all sources of 1,695 king salmon taken by sport gear during 1967.

TABLE 5 - Estimated Military Harvest of King Salmon, Naknek River, 1967.

Location	Reported King Catch (R)	Adjustment Factor (F)	Estimated Catch (X)
Lake Camp	54 (R_1)	58% (F_1)	93 (X_1)
Rapids Camp	464 (R_2)	78% (F_2)	595 (X_2)
Base Camp	379 (R_3)	72% (F_3)	526 (X_3)
	Total Estimated Military Harvest		1,214 (X)

The estimated military sport catch is derived by the following formula:

$$\frac{R_n \times 100}{F_n} = X_n$$

Where:

R_n = Reported catch at each site as recorded on ALCOM creel census forms received.

F_n = Ratio of reported catch to estimated catch, expressed in percent, as indicated by freezer inventories at the Lake and Rapids Camps and direct checks at the Base Dock during the month of June.

X_n = Estimated catch at each site.

The foregoing calculation assumes no difference in rate of fishing success between military and civilian anglers.

Using actual numbers of king salmon tallied during the direct census, a lower figure is obtained. Of a total of 278 fish observed, 83 percent were taken by military anglers. Substituting the observed catch for M in the above equation, an estimated total of 1,463 king salmon taken by the sport fishery is derived. The mean of the two estimates is 1,579 fish.

No attempt has been made previously to statistically estimate a total sport catch of king salmon for the Naknek River. Redick (1967) estimated that the total catch in 1966 was "less than 1,000 fish." While the methodology used in arriving at the present estimated total catch of this species admittedly leaves much to be desired, it appears that the estimated king salmon catch for the 1967 season is considerably in excess of previous estimates. Comparison of Base Dock effort figures for 1966 and 1967 shows a 19 percent drop in total military effort at that facility for the latter year. Civilian effort stems primarily from residents of the King Salmon area, as commercial boat rental facilities do not yet exist on the Naknek River. No appreciable change in the civilian resident picture can be found which would be likely to affect fishing effort from that source. It seems unlikely that the actual catch of kings during 1967 was greater than in the preceding year. Apparently the sport fish take in the past has been considerably in excess of reported catches or estimates.

Rainbow Trout - Unlike the king salmon fishery, which is limited to approximately six weeks duration and a few miles of river, the sport effort for rainbow trout is spread widely in both time and space. Rainbow trout are taken in greatest numbers near the Lake and Rapids Camps but occur occasionally in the fishery downriver as far as the Smelt Creek confluence. The fishery continues throughout the year, with the exception of intermittent wintertime periods of prohibitive weather conditions and the April 15-June 7 closure. In discussing this fishery, Redick (1967) has suggested a number of reasons why the catch rate and total harvest have apparently declined during the preceding ten-year period. A review of these possibilities indirectly points out the major problems facing the collection of accurate creel census information for this species.

Redick (op. cit.) postulated that the number of rainbow trout present in the river may have declined, but minimized this possibility by reference to the ready availability of rainbow trout which he observed during 1966, particularly in the smaller size ranges. He also cited an apparent lack of any decline in average size as indicated by reported lengths from ALCOM census forms. In discussing the reliability of individual lengths reported by the voluntary ALCOM census, the present writer has described them as "completely unusable" (Paddock, 1965). There is no dependable record of catch composition for this fishery for any year prior to 1966. The 1967 sampling is not amenable to a determination of catch composition for the entire season.

The availability of rainbow trout above 20 inches in length throughout the late summer and fall of 1966 as reported by Redick was evidently much greater than during the 1967 season. Comparatively few fish longer than 20 inches occurred in the catch during the latter part of 1967, though smaller sizes continued to remain abundant.

When records were first collected, the majority of the effort arose from the military camps (Allin, 1959). New developments have since taken place, such as the all-weather road now completed from King Salmon to the outlet of Naknek Lake. This has recently provided easy access during the entire winter and spring. No measure of this now important fishing effort has yet been obtained. Year-round observations should at last be possible during the 1968 season, with an investigator present in the study area throughout the entire year.

During 1967 the percentage of rainbow trout in the total catch showed a marked increase (Table 6). Catch per hour of this species indicated a rise, reversing the downward trend of the last decade (Table 7). Early census reports were received from the Lake Camp during the last half of May with 141 rainbow trout reported. Since the catch per hour of this species did not increase proportionally with the reported catch at either the Lake or Rapids Camp during the season, it seems likely that the improved participation in reporting noted earlier, plus additional effort directed specifically toward rainbow trout may help to explain the increased 1967 catch.

It will be noted in Table 6 that the percentage of red salmon taken at the Lake Camp apparently dropped slightly, while an increase is shown for the Rapids Camp. No voluntary creel census reports were received from either camp after July 31, though the Rapids Camp continued to operate until August 18 and the Lake Camp did not close until the end of September.

At the Rapids Camp, red salmon are first taken as they are migrating upstream. By the end of July, this migration past the Rapids Camp area is complete. After this date red salmon are taken almost entirely from large schools which remain in the first mile or two of the Naknek River near the Lake Camp until moving onto the spawning grounds. As noted earlier, some

TABLE 6 - Percentage Composition of Reported Catches at the Lake and Rapids Camps, Naknek River, 1957, 1960, 1963, 1966 and 1967.

	Rainbow	Red Salmon	King Salmon	Dolly Varden	Grayling	Others*
Lake Camp						
1957	83.2	0.5	1.5	4.9	7.1	2.8
1960	69.2	8.9	2.4	2.1	10.9	6.5
1963	67.3	20.7	-	1.2	5.8	5.0
1966	32.5	60.4	0.5	1.4	0.5	4.7
1967	39.0	54.5	3.0	0.8	0.2	2.4
Rapids Camp						
1957	58.0	0.8	9.4	11.2	15.8	4.7
1960	28.7	0.3	48.7	2.1	7.2	13.0
1963	15.8	33.8	41.6	1.1	6.3	1.3
1966	13.1	40.1	32.6	0.7	5.7	7.8
1967	19.3	45.5	28.1	1.8	4.7	0.4

*Other includes lake trout, Salvelinus namaycush; pike, Esox lucius; silver salmon, O. kisutch; chum salmon, O. keta; pink salmon, O. gorbuscha; and round whitefish, Prosopium cylindraceum.

anglers from the Rapids Camp do travel to the Lake Camp to fish for red salmon during August. Reports from both camps during this month would include good numbers of this species and could alter the reported species composition appreciably. For the foregoing reasons, it is extremely difficult to determine whether the observed fluctuations in composition and apparent abundance are accurate or whether they may be the products of vagaries in reporting throughout the entire period under discussion.

TABLE 7 - Fishing Success for Rainbow Trout at the Rapids and Lake Camps, Naknek River, 1957, 1960, 1963, 1966 and 1967.

Location	Year				
	1957	1960	1963	1966	1967
Rapids Camp					
Reported Catch	1160	472	219	37	319
Catch Per Hour	0.39	0.14	0.07	0.08	0.10
Lake Camp					
Reported Catch	1461	871	467	607	694
Catch Per Hour	0.64	0.46	0.34	0.28	0.35

Redick (1967) also stated his belief that increased utilization of red and king salmon, rather than a decline in rainbow abundance, may constitute the principal reason for the continuing decline of this species in the composition of the combined catch observed during the 1957-1966 period. Figure 3 shows a direct correlation between fishing effort and rainbow trout catch for the period under discussion, with catch per unit of effort presently much reduced from earlier years. While diversion of effort to red and king salmon obviously accounts in part for the observed decline in fishing success for rainbow trout, it seems unlikely that the present almost complete reliance of the Lake Camp fishery upon red salmon during August would exist if rainbow trout were as readily available today as they were ten years ago. Without more reliable annual catch totals and some indication of the dynamic effect of the fishery upon size composition of the population, it is difficult to arrive at defensible conclusions regarding the true status of the population composition at present.

Silver Salmon - Observations during the 1967 season indicate that the sport fishery for silver salmon was very similar to that described by Redick (1967). The fish appeared in good numbers during the first week of August, apparently peaked during mid-August, but continued to be available until mid-September. Military participation was very low but civilian effort continued regularly and strongly throughout the period. The sport fishery was observed closely, but sampling was not designed to yield fiducial estimates.

Pink Salmon - Since 1967 was an off year for pink salmon, which normally return in strength only during the even numbered years, there was no appreciable fishery for this species. A few individuals were taken incidental to the red salmon fishery at the Lake Camp.

Red Salmon - Certain events affecting the 1967 census of this species have been noted in the preceding discussion of rainbow trout. The escapement of red salmon past the Naknek River counting tower reported by the Commercial Fisheries Division was 755,640 fish. While lower than the average escapement obtained for this system in recent years, this number was abundantly adequate to allow a high rate of success for most participating anglers.

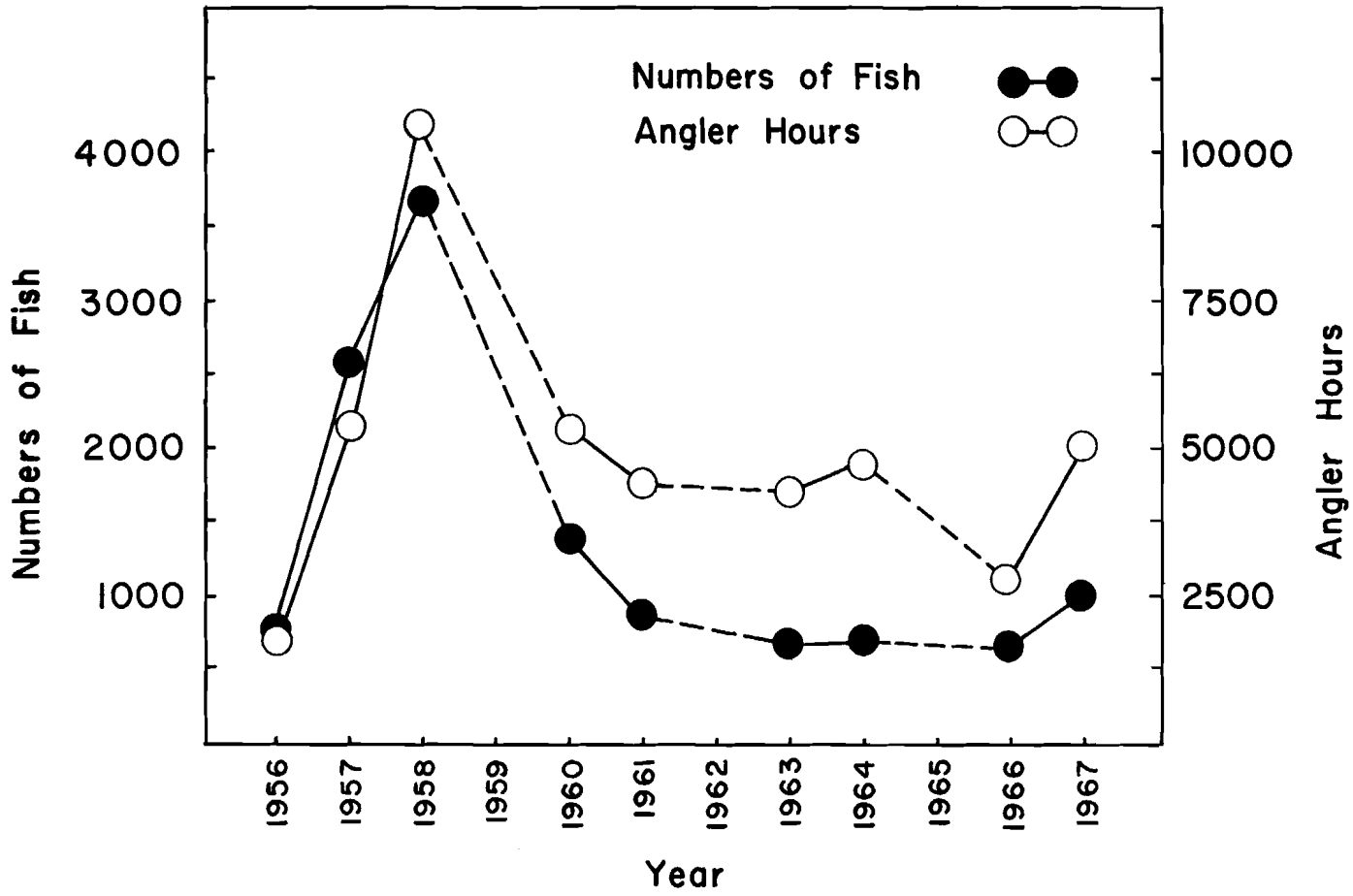

FIGURE 3. Reported Catch and Fishing Effort for Rainbow Trout, Lake and Rapids Camps, 1956-1967.

TABLE 8 - Creel Census and Population Sampling Summary, Tikchik Lake Narrows, August 14 to October 11, 1967.

Shore Fishermen

No. of Fish	Species*	Percent Composition	Length Range (cm)	Mean Length (cm)	Total Hours	Catch Per Hour
70	GR	62.0	14.0 - 44.5	32.6		1.58
35	LT	31.0	46.4 - 72.4	56.8		0.79
8	AC	7.0	28.0 - 63.5	50.5		0.18
113	Fish	100.0	---	--	44.4	2.55

Boat Fishermen

42	GR	28.4	22.9 - 48.3	34.6		0.38
92	LT	62.1	28.1 - 78.7	52.6		0.83
8	AC	5.4	43.2 - 58.4	53.3		0.07
6	RB	4.1	45.7 - 76.2	66.3		0.05
148	Fish	100.0	---	--	111.4	1.33

*GR = Grayling
LT = Lake Trout
AC = Arctic Char
RB = Rainbow Trout

Tikchik Lakes Area

Census efforts in the Tikchik Lakes area during 1967 were carried out from a camp at the Narrows between Nuyakuk and Tikchik Lakes. This location normally attracts the most angler effort and is centrally situated for convenient access to other sites of interest.

It is estimated that the period of observation, August 14 to October 11, covered approximately one-half of the actual 1967 angling season at this location. All of the fishing pressure at this location stemmed from military personnel during this period. Assuming the validity of these proportions, an estimate of 168 man days is obtained for the Narrows. An additional 68 days of effort at this site earlier in the season is reported for guide Bob Curtis' customers. Thirty-two days of effort elsewhere in the lower Tikchik Lakes area contributed a minimum total of 268 man days for the Tikchik system. Only fragmentary census information was obtained on effort at outlying locations during this time.

At the Narrows area, a distinct difference in catch composition is shown (Table 8), depending upon method of fishing. The catch by anglers who fish from shore with either lures or flies tends heavily toward grayling which predominate in the shallower portions of the Narrows. Those anglers casting or trolling from a boat encounter a preponderance of lake trout with a corresponding reduction in grayling availability. The proportion of the less abundant Arctic char, Salvelinus alpinus, is consistent by either method. Rainbow trout were taken only when fishing from a boat.

Additional construction work is still continuing at guide Bob Curtis' facility. The lodge, located immediately at the Narrows, gives indication of providing substantial future pressure. The prospective status of the Air Force facilities remaining near the rehabilitation site of the now-evacuated C-123 is uncertain at this time, but there are indications that it may be developed into another military recreation camp.

Guide Theodore J. Almasy's operation was inactive during 1967.

Katmai National Monument Fishing Effort

No detailed information is available on fishing effort within the Monument. However, the U.S. National Park Service does maintain records of registered campers. Such a record may assist in establishing an index of angling pressure. Table 9 is a listing of visitor registration during 1967. The park ranger estimates that an additional 20-25 percent were not included among the registered visitors. These consisted mainly of parties arriving via their own transportation. He further estimates that about 75 percent of all campers at the Brooks River campgrounds participated in sport fishing to some degree. Utilizing the above-mentioned percentages, a minimum estimate of 965 angler days may be calculated. Most of this effort is directed toward Brooks River.

TABLE 9 - Visitor Registration at Katmai National Monument, 1967.

Accommodation	Number of Visitors
Northern Consolidated Airlines Brooks Camp	878
Designated Park Campgrounds	166
Undesignated Campgrounds	29
Total Visitor Registration	1,073

Other Fishing Pressure

Following the 1967 season, inquiries were sent to 19 guides and lodge operators who are currently known to operate within the job area, requesting information on the amount of angler days of fishing effort attributable to their clients. To date, 14 replies have been returned. One of these, Northern Consolidated Airlines Kulik Camp, accounted for 1,500 man days alone. The remaining 13 respondents totaled 2,113 man days, for a figure in excess of 3,600 days of angler effort from this small sampling alone.

This less detailed approach has produced much improved results over those formerly obtained when information requested included species composition, location, fish size, and fishing hours.

Total Angling Pressure Estimates

It is possible to list the effort from individual fisheries or areas within the study area for which estimates have been secured and thus produce a minimum total effort of 15,980 angler days (Table 10). This estimate does not include Bristol Bay resident effort, very little of the fly-in effort from Anchorage and the surrounding area, and only that non-resident effort (other than military) reported by the responding guides and in the Katmai National Monument. Also excluded is the rather sizeable effort contributed by persons visiting the area primarily for reasons other than fishing and tourism. While no similar summation has been assembled in prior years, it is evident that fishing pressure in the study area is increasing rapidly.

TABLE 10 - Reported Bristol Bay Fishing Effort, 1967.

Fishery or Information Source	Angler Days
Naknek River	
Lake Camp and Rapids Camp	6,867
Base Dock	4,267
Katmai National Monument	965
Tikchik Census	268
Responding Commercial Operators	
NCA's Kulik Camp	1,500
Others (13 operators)	2,113
Total	15,980

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